ATTO Technology, Inc.

iPBridge 1550D
Installation and Operation Manual

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Contents

1 ATTO iPBridge provides storage options

The ATTO bridge family of products provides GbE-to-SCSI GbE-to-Fibre Channel or Fibre Channel-to-SCSI bridges available as embeddable boards, stand alone enclosures that can be fitted for rackmount integration, or desktop units, depending on the model and your needs.

The ATTO iPBridge and ATTO FibreBridge family of products share common configuration options and functions to provide the most versatile connectivity options available. Each product has been engineered to address specific customer needs. New capabilities are integrated into products throughout the family as much as possible, requiring only an upgrade of firmware to incorporate them into your SAN (Storage Area Network) or NAS (Network Attached Storage).

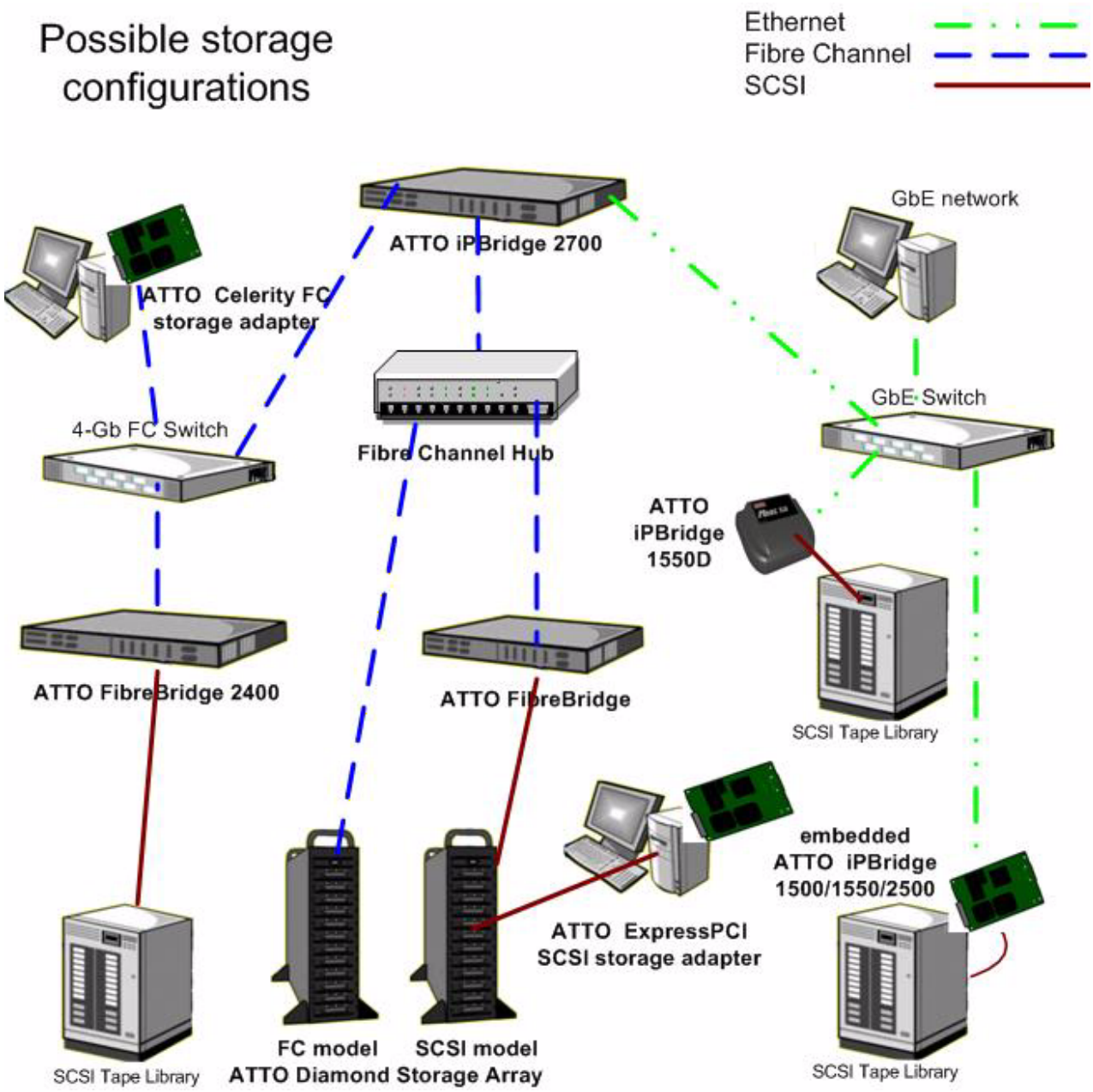
The ATTO iPBridge 1550 is a cost-effective way of expanding your existing storage capacity without sacrificing performance. The ATTO iPBridge 1550 is ideally suited to the SME or for corporate IT departments seeking to expand storage requirements with minimal disruption while making existing SCSI equipment accessible over an Ethernet network to all network users.

To make sure you have the most up-to-date version of the firmware, visit the ATTO Technology website, **www.attotech.com**.

Features

- One independent Gigabit Ethernet port and one independent Ultra 320 SCSI port
- ATTO ExpressNAV™, integrated web server for configuration, upgrades, monitoring and management
- ATTO ExpressWizard, one-button initial setup for most configurations
- Inband LAN-based monitoring and management
- Command Line Interface (CLI) for configuration and management
- RS-232 serial port with RJ-11 connector
- Diagnostic capabilities
- Support for manual and auto LUN mapping
- *i*ntelligent Bridging Architecture™ for optimized performance
- Near wire speed sustained throughput
- Ideal solution for connecting high performance tape and disk devices to an IP Storage Area Network (SAN)

Exhibit 1.0-1 Possible storage solutions using the iPBridge.



1.1 Physical components

The ATTO iPBridge 1550D is a 1-Gigabit Ethernet to Ultra 320 SCSI desktop bridge which produces a cost-effective iSCSI solution for SMB/SME environments.

Dimensions

Width: 7.5 inches wide
Depth: 5.0 inches long
Height: 1.76 inches

Environment

Operating Temperature: 0-70 °C external Ambient air should not exceed 40 °C
Humidity: 10-90% non-condensing

Power

The iPBridge 1550 uses a 12-volt power brick connected to an appropriate power source. The power source must be connected to a protective earth ground and comply with local electrical codes. Improper grounding may result in an electrical shock or damage to the unit.

Input voltage: 12v@1.5A
100-240 VAC, 0.5A@100v, 47-63 Hz

SCSI port

The SCSI port is an Ultra 320 LVD/SE SCSI bus with 68-pin “P” interface; downward compatible with all forms of low voltage differential and single-ended SCSI.

Ethernet port

The 10/100/1000 GbE RJ-45 Ethernet port uses the Intel 8254x family gigabit Ethernet chipset to support iSCSI data transfer and inbound management. GbE cables must be at least CAT-5E certified.

Serial port

An RS-232 serial port provides support for remote monitoring and management. The serial port is set at the factory at 115,200 bps.

Reset switch

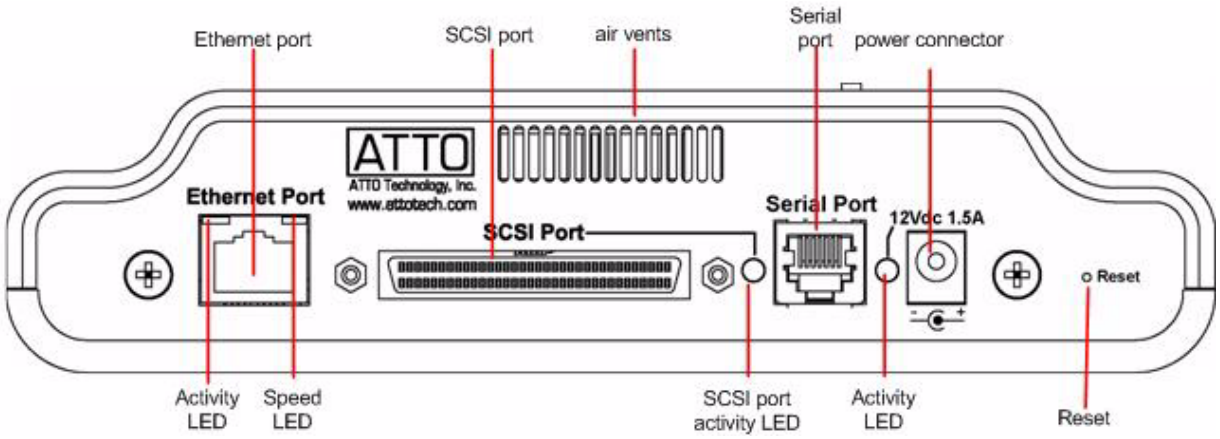
A manual reset switch is mounted on the back panel. Insert a tool in the hole in the back panel to activate the switch, wait until the Activity LED on the top of the iPBridge becomes green, then cycle power. The iPBridge is reset to factory defaults

LED indicators

Ready/SCSI Port Activity: a green LED on the top and on the back of the iPBridge lights solid green to indicate ready and blinks to show SCSI activity and to identify the iPBridge when commanded by software.

Ethernet port: two LEDs are integrated into the Ethernet connector. One lights solid green to denote a complete link and blinks green to show activity. A bicolor green/yellow LED lights yellow to indicate 1 Gb/sec. transmission speed and lights green to show 100 Mb/sec. speed.

Exhibit 1.1-1 iPBridge 1550D back panel



2 Installation

If you have not already completed the instructions on the Quick Start packed with your iPBridge, use the following instructions to install the iPBridge.

Unpacking the packing box; verifying contents

- The iPBridge
  Note the serial number of your iPBridge, located on the bottom of the unit, for later use:
  _____
- Power cord
- Power brick
- CD which includes the iPBridge firmware, the Installation and Operation Manual, the ATTO QuickNAV program and ATTO iPBridge drivers.

Installing the iPBridge

1 Place the iPBridge on a stable flat surface.

2 Connect the host computer to the Ethernet port.

3 Connect SCSI devices to the iPBridge using the proper SCSI cables. For details refer to Cabling on page i of the Appendix.

4 Power up the SCSI devices. Proper termination is required.

Note

You must power up attached devices before adding power to the iPBridge.

5 Connect the iPBridge Ethernet port to your network using at least Cat5e cable. For details refer to Cabling on page i of the Appendix.

6 Connect the AC power cord from the iPBridge to the proper AC source outlet, connect the AC power cord to the power brick and connect the brick to the iPBridge.

CAUTION

The power source must be connected to a protective earth ground and comply with local electrical codes. Improper grounding may result in an electrical shock or damage to the unit.

7 Wait for the iPBridge Ready LED to light indicating the bridge has completed its power-on self test sequence.

8 Windows® users continue to Installing Windows drivers; Mac® users continue to Discovering the IP address.

Installing Windows drivers

1 Windows automatically detects the iPBridge and asks for the driver in the **Add Hardware** wizard. Select **Install from a list or specific location**

2 Click **Next**

3 Choose **Don't Search**

4 Click **Next**

5 Choose **Have disk**

6 Specify the driver as found in the **PC** folder in the setup CD. The files are in a folder based on your operating system: Win2K drivers for Windows 2000 and Windows XP/2003 drivers for all 2003 Server products.

Note

Use the files directly from the CD or copy them onto a floppy or to a local directory on your hard drive.

7 Follow the remaining instructions to complete the installation procedure.

8 After the driver is installed, the iPBridge is listed in the **System Devices** folder.

Discovering the IP address.

1 From the CD supplied with your iPBridge, run the QuickNav Utility **QuickNAV-windows.exe** for Windows or **QuickNAV-Mac** for Mac OS X.

2 Locate the iPBridge with the serial number recorded earlier.

3 Highlight the serial number.

4 Click **Next**.

If a DHCP server is available on your network, an address is assigned automatically by the server. Note the assigned address:

_____

If you do not have a DHCP server, get an IP address and subnet mask from your network administrator, type it into the area provided, and select **Next**. Note the IP address and subnet mask here._____

5 Click on **Launch Browser**

Your browser points to the ATTO ExpressNAV splash screen.

Windows users continue to Installing MS iSCSI Initiator for Windows; Mac users continue to Installing iSCSI Initiator for Mac OS X.

If you use Internet Explorer, use Setting up Internet Explorer if needed.

Installing MS iSCSI Initiator for Windows

1 Download the latest version of Microsoft® iSCSI Software Initiator from **www.microsoft.com/downloads.** Searching on **iSCSI Initiator** usually helps to locate it.
2 Launch the Initiator installation program and follow the instructions.
3 Find the Microsoft iSCSI Initiator icon on your desktop and launch the program.
4 Click on the **Discovery** tab.
5 Click on the **Add** button under the target portal heading.
6 Type in the iPBridge IP address previously-recorded in Discovering the IP address. on page 5.
7 Click on **OK**
8 Click the **Targets** tab.
9 Click on **Log on** button.
10 Select **Automatically restore this connection when the system reboots.**
11 Click **OK** to complete logon.
12 If the **Found New Hardware Wizard** appears, follow the instructions and install the iPBridge driver from the CD that came with your iPBridge.
13 Click **OK** to close the iSCSI Initiator utility.

You should now have storage you can manage through Windows Disk Management. Continue to Beginning initial configuration.

Installing iSCSI Initiator for Mac OS X

Contact your ATTO sales representative or go to **www.attotech.com** to purchase the ATTO Technology Xtend SAN, iSCSI Initiator for Mac OS X.

Setting up Internet Explorer

1 Open your browser
2 Select **Internet Options**.
3 In the **Internet Options** screen, select the **Security** tab.
4 Click on the **Trusted Sites** icon.
5 Click on the **Sites** button.
6 In the text box **Add this Web site to the zone**, add the IP address of the iPBridge. You may use wild cards.
7 Click on **Add**
8 Uncheck the **Require server verification** check box.
9 Click **OK.**
10 At the bottom of the **Internet Options** box, click on **OK** and close the box.

Beginning initial configuration

1 Return to the ExpressNAV interface welcome screen. Click on **Enter Here**
2 Type in the user name and password.

Note

*The default values are user name **root** and password **Password**. The user name is case insensitive and the password is case sensitive.It is best practice to change the default user name and password. Refer to Modify passwords on page 13.*

3 The **Status** page appears. Continue to Configure the iPBridge on page 7.

3 Configure the iPBridge

To configure the ATTO iPBridge, use ATTO ExpressNAV. Default values are appropriate for most configurations, but may be modified. The ExpressWizard simplifies initial configuration of the iPBridge.

Default values are appropriate for most applications. If you wish to change these values, use ATTO ExpressNAV, a browser-based graphical interface. Other methods are also available. Refer to Interface options on page 23.

If you do not use the ExpressWizard, continue to

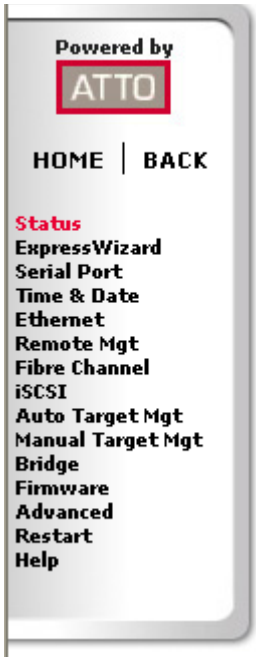
- Mapping and addressing, also known as Target management on page 9
- iSCSI configuration on page 12
- Optional changes on page 13

Preliminary steps

1 If you are not already in the ExpressNAV interface, type the IP address of your iPBridge in a standard browser as found in Using ExpressNAV on page 23, click **Enter Here,** type in your user name and password, and click **OK**.

2 The **Status** page appears.

You may view the default settings by clicking on each element in the left hand menu, then continue in one of three ways:



- Review the settings, keeping the automatic settings created when you powered up your iPBridge and do nothing now.
- Use the **ExpressWizard**, accessed from the side menu, to initially set up your iPBridge and its attached storage for specific applications automatically.
- Use the individual pages listed on the side menu to make changes or use other features as needed.

ExpressWizard

Most applications may be set up automatically using the ExpressWizard from the ExpressNAV interface. The ExpressWizard simplifies initial configuration of the iPBridge

1 Follow the Preliminary steps.

2 From the side menu select **ExpressWizard**.

3 Select your storage type

- **Digital video disk storage**: optimized for digital video (sequential access) configurations
- **Digital audio disk storage**: optimized for audio applications (sequential access)
- I**T/database disk storage** optimized for general IT and database applications (random access).
- **Tape storage**
- **Optical storage**

4 Click **Next.**

5 In the **Devices Detected** page, click on **Rescan** to ensure all the devices you wish in your storage configuration are present. The ExpressWizard uses all attached storage for the configuration.

6 When all devices are listed, click **Next**.

7 Set your administrator password.

8 Click **Next**.

9 Select the answer to the question **Does your network support Jumbo Frames?**

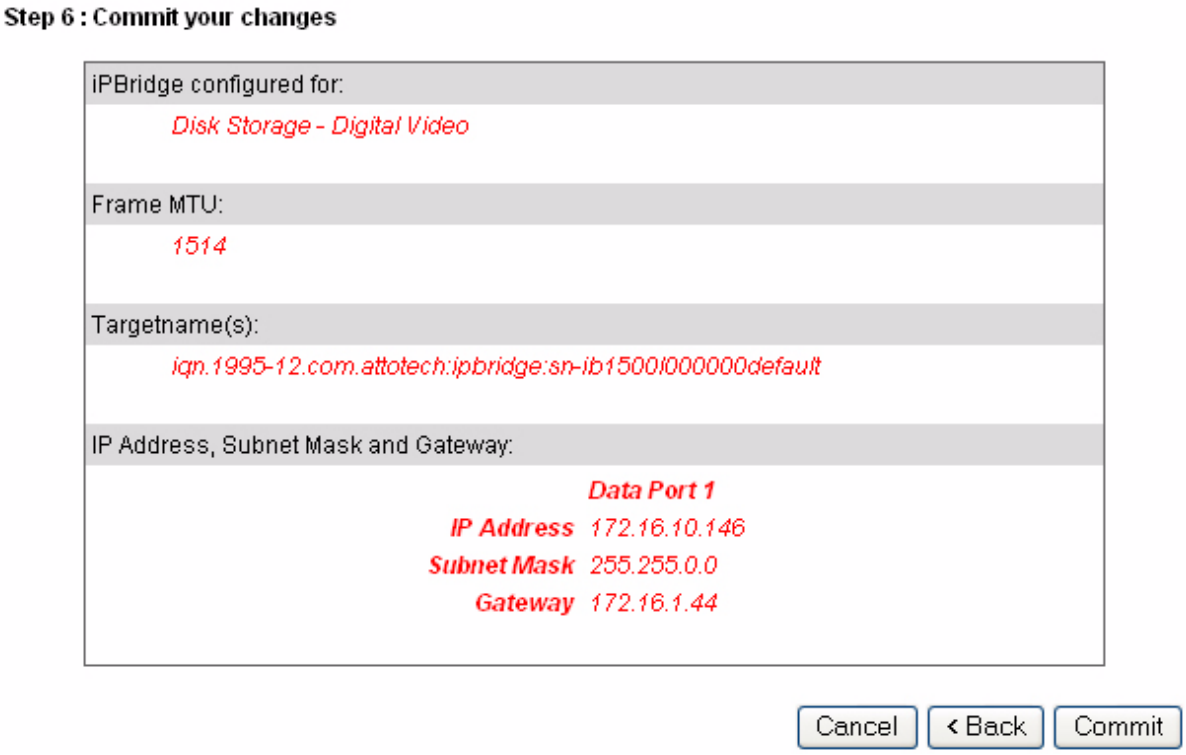
10 Click **Next.**

11 Data port IP address, subnet mask and gateway information is listed. Change any elements as needed.

12 Click **Next.**

13 The configuration for the iPBridge based on your input in the previous screens appears. If the information is correct, click **Commit.**

14 The ExpressWizard configures your iPBridge and storage. You may select items on the left side menu to view the current configuration or to change the configuration at any time.



3.1 Target management

Storage devices are mapped using the designations for the iSCSI LUN. The easiest way to map devices is to use the Automatic Target Management feature in the ATTO ExpressNAV interface.

CAUTION

Changing the device map can affect the host's view of devices and your application configuration.

To map SCSI devices, you must connect the devices to the iPBridge SCSI port. To access mapped SCSI devices over Ethernet, you must have a host computer connected to the iPBridge Ethernet data port.

If you decide to change the automatic mapping set up when you powered up the iPBridge, you have two options to map devices after you disable automatic mapping:

- You may map devices manually to the single default node.
- You may map each device to its own target, breaking the single iSCSI target node into multiple nodes. Multiple target nodes allow flexibility to grant or deny access between initiators and devices.

If you divide the default single target node into multiple target nodes, you must set up access to each node separately.

Target names

Each iSCSI target node is identified by a unique world-wide iSCSI-qualified name which references the iPBridge serial number and target node name:

```
iqn.1995-12.com.attotech:ipbridge:
serialnumber <targetname>
```

Default target node

The default target is set as a single target with Access Control (ACL) disabled and CHAP authentication disabled. The default target node cannot be deleted.

Use the ExpressNAV interface to map devices automatically or manually. Refer to Opening an ExpressNAV session on page 23 for information about ExpressNAV.

Automatically configure a single target

1. If you have not already, open an ExpressNAV session. For instructions, refer to Opening an ExpressNAV session on page 23, click **Enter Here,** type in your user name and password, and click **OK**.
2. The **Status** page appears. From the ExpressNAV menu, select **Auto Target Mgt**.
3. Click on the **Map all devices to default target** button.
4. When the action is complete, the **iSCSI Target Management** page appears. Make any adjustments to the mapping or begin a discovery session.
5. When the action is complete, the **iSCSI Target Management** page appears. From there you may make adjustments to the mapping or begin a discovery session.

   If you are prompted to restart the iPBridge, go to the **Firmware Restart** page and restart the iPBridge.

Map devices manually

1. If you have not already, open an ExpressNAV session. For instructions, refer to Opening an ExpressNAV session on page 23, click **Enter Here,** type in your user name and password, and click **OK**.
2. The **Status** page appears. Select the **Manual Target Mgt** menu item on the left panel.
3. Click on the **Device Maps** link of the default target.
4. Select the devices from the box on the right panel and drag to the appropriate LUN on the central panel.
5. Click **Submit**.

   If you are prompted to restart the iPBridge, go to the **Firmware Restart** page and restart the iPBridge.

Multiple target nodes

Multiple targets allow you to create a more configurable mapping scheme which can segregate storage into different iSCSI nodes within the iPBridge, with each iSCSI target having its own set of access criteria.

For example, if you have two servers and a library with four tapes and a media changer, the default node would provide both servers access to all tapes and the media changer (default target mode).

If you configured multiple target nodes, you are able to map some devices to one server and other devices to the other server, requiring separate user names and passwords for access using various methods including Access Control Lists, iSNS and CHAP authentication. Consult with your network administrator and refer to Exhibit 3.1-1.

Note

If you map actual storage to more than one iSCSI target and a server has authorization for both targets, the server could show duplicate storage without any warning.

Automatically configure multiple targets

1 If you have not already, open an ExpressNAV session. For instructions, refer to Opening an ExpressNAV session on page 23

2 From the ExpressNAV main menu, click on the **Automatic Target Management** menu item on the left side of the screen.

3 Click on the **Map each device to its own target** button.

A target name suffix is attached to the iqn of each SCSI device such as

`vendorid-devicename-xxx`

- **vendorid** is the SCSI device vendor ID
- **devicename** is the SCSI device's inquiry device name.
- **xxx** is a device index

When the action is complete, the **iSCSI Target Management** page appears.
If you are prompted to restart the iPBridge, go to the **Firmware Restart** page and restart the iPBridge.

Manually configure multiple target nodes

1 If you have not already, open an ExpressNAV session. For instructions, refer to Opening an ExpressNAV session on page 23

2 The **Status** page appears. Select **Auto Target Mgt** menu item on the left side of the screen.

3 In the **iSCSI Target Management** page, type **[name]** in the **Add an iSCSI target** box

The name is a suffix appended to the standard IPBridge iqn name. The suffix name can be up to 24 characters.

4 Click on the device map link of your target.

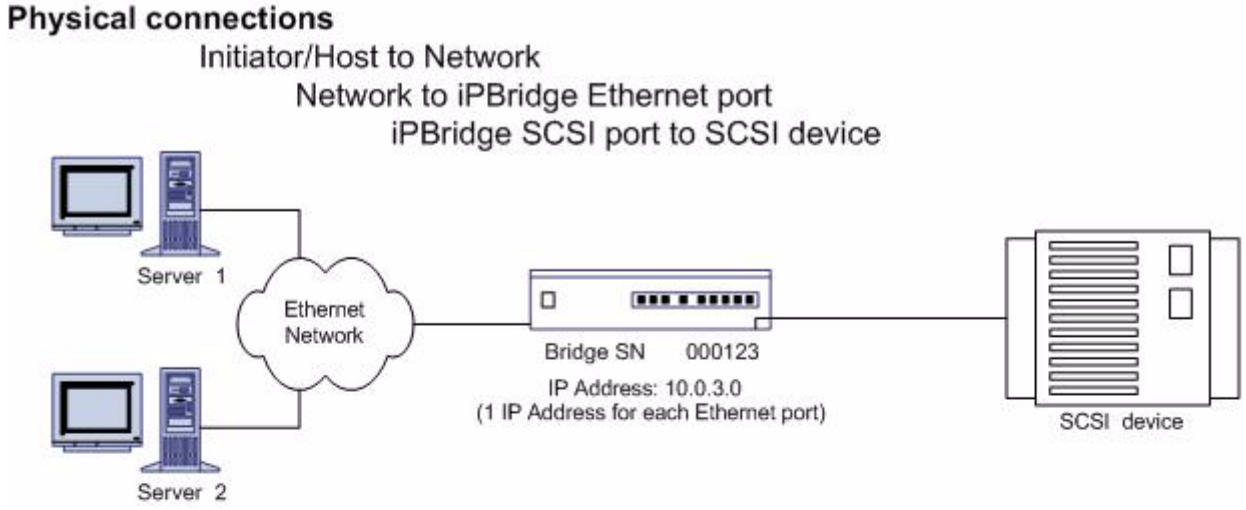
5 After the next mapping page opens, drag the boxes representing devices to the LUNs you want.

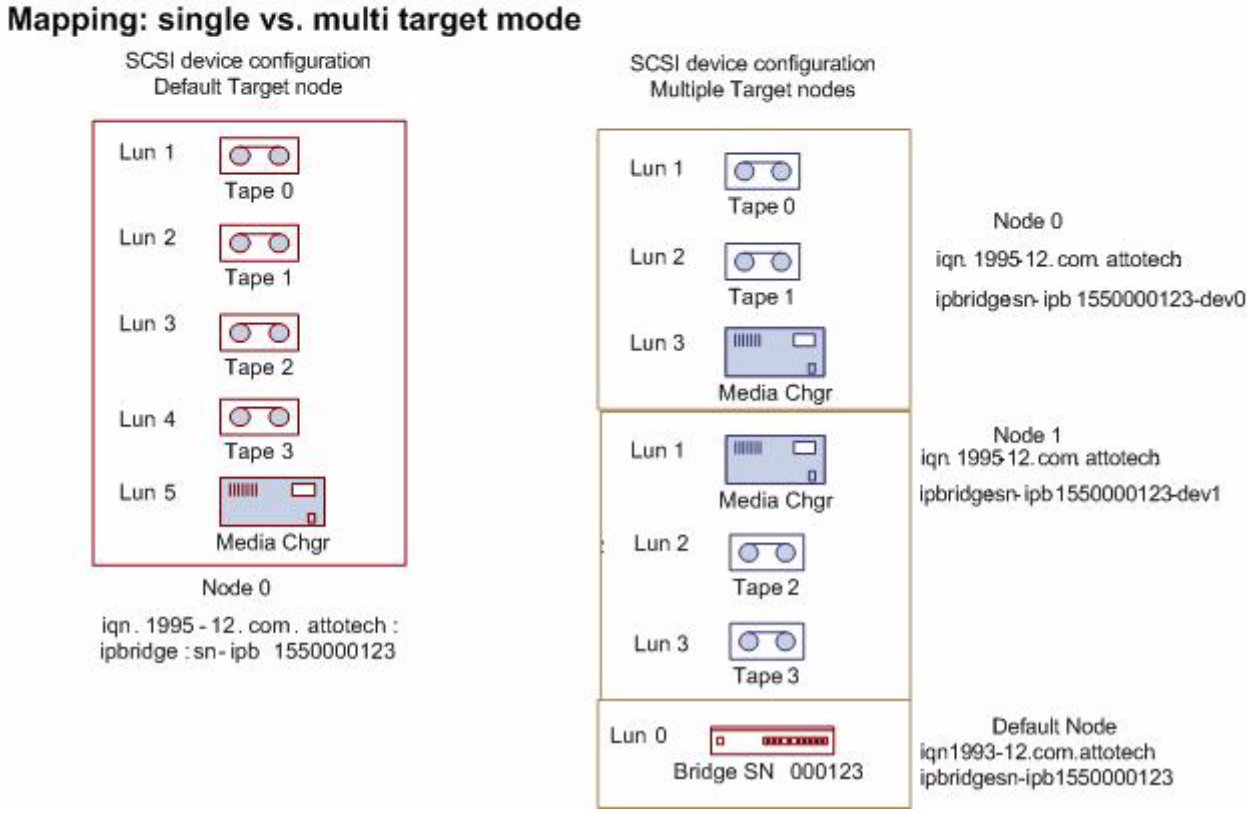
6 Click **Submit**.

7 Repeat from Step 3 for each node you want to configure.

8 If you are prompted to restart the iPBridge, go to the **Firmware Restart** page and restart the iPBridge.

Exhibit 3.1-1 Target node configurations.





3.2 iSCSI configuration

You may fine-tune the iPBridge using the ATTO ExpressNAV interface.

Several special iPBridge features may be accessed using the ExpressNAV graphical user interface. For details on each command, refer to CLI provides an ASCII-based interface on page iii of the Appendix

1 If you are not already in the ExpressNAV interface, type the IP address of your iPBridge in a standard browser as found in Using ExpressNAV on page 23, click **Enter Here,** type in your user name and password, and click
2 The **Status** page appears. Click on the menu item which regulates the parameter you wish to change.
   - Ethernet: iSCSI port number
   - iSCSI iSCSI Alias, ISNS Login Control, iSNSServer, Speedwrite
   - CHAP commands: iSCSI Chap Secret, iSCSI Target in the **Manual Target Mgt** menu
3 Click **Submit** on each page after you make changes to save your choices. When you have completed all changes, go to the **Restart** page and click on **Restart**.

Ethernet

Click on the **Ethernet** menu item.

iSCSI Port Number

Specifies the port number whereby the iPBridge listens for iSCSI connections. The port number must be between 1024 and 65535 except for port 860. The default is 3260.

iSCSI

Click on the **iSCSI** menu item.

iSCSI Alias

Provides a human-readable name assigned to the iPBridge. Aliases may be 1 to 64 characters long and may contain spaces if spaces are enclosed in quotation marks. The default is a blank space.

iSNS Login Control

Specifies whether the iPBridge will delegate its access control/authorization to an iSNS server. Default is disabled.

Note

*iSNS Login Control cannot be used with Access Control found on the **iSCSI Target Management** page.*

iSNSServer

Specifies whether the IP address of a valid iSNS server from which the iPBridge will attempt iSCSI initiator discovery. Setting to 0.0.0.0 disables the iSNS server lookup. Default is 0.0.0.0.

SpeedWrite

When enabled, improves the performance of WRITE commands to SCSI devices attached to the iPBridge.

CHAP commands

To find the CHAP commands,

1 Click on the **Manual Target Mgt** menu item
2 Click on the **Target Management** page
3 Click on the **iSCSI CHAP** table entry next to the iSCSI target you wish to use.

iSCSI CHAP

iSCSI CHAP controls whether CHAP (Challenge Handshake Authentication Protocol) is used for the iSCSI protocol. If CHAP is enabled, the target requires the initiator to negotiate CHAP authentication using CHAP secrets (passwords). An initiator may reject this negotiation.

iSCSI Chap Secret

Specifies the incoming and outgoing secrets (passwords) for iSCSI CHAP sessions. Secrets are case sensitive, 12 to 32 characters (16 for Microsoft iSCSI initiator), and cannot contain spaces. **In** and **out** secrets must be different.

An **in** secret is for authentication of the server to the iPBridge. The iPBridge can store up to 32 in secrets.

An **out** secret is for authentication of the iPBridge to the server. There is only one out secret per target that cannot be deleted.

iSCSI Target

Creates or deletes an iSCSI target name. The target name acts as a suffix to the standard bridge iSCSI-qualified name. The target name may not exceed 24 characters.

3.3 Optional changes

Default values, even if you have not used the ExpressWizard, are appropriate for most configurations, but may be modified.

Preliminary steps

1 If you are not already in the ExpressNAV interface, type the IP address of your iPBridge in a standard browser as found in Using ExpressNAV on page 23, click **Enter Here,** type in your user name and password, and click **OK**.

2 The **Status** page appears.

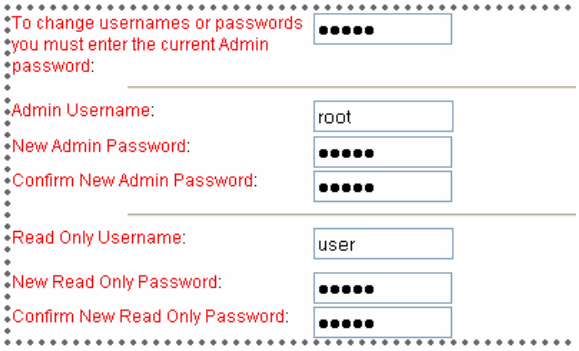
View the default settings by clicking on each element in the left hand menu, then use the individual pages listed on the side menu to make changes or use other features.

Modify passwords

1 Follow the Preliminary steps

2 Click **Bridge**.

The **Bridge Configuration** page is displayed.



The Administrator user name that you are currently logged in with and the current read only user name, if present, are displayed in their text boxes.

3 Enter the Administrator (Admin) password where indicated.

4 Enter appropriate information into the **New Admin Password, Confirm New Admin Password** or **New Read Only Password** and **Confirm New Read Only Password** text boxes.

5 Click **Submit.**

6 Go to the **Restart** page and restart the iPBridge.

Set up a VLAN: Virtual Local Area Network

A Virtual LAN (VLAN) is a group of devices on the same physical LAN which can communicate with each other as if they were all on different physical LANs. This creates a network that is independent of physical location, allows grouping of users into logical workgroups, increases efficient use of resources, and adds security options by allowing some users into the LAN and keeping other users out.

You may create up to eight Virtual LAN IDs for each Ethernet data port. Each VLAN ID is assigned a VLAN name of up to 64 characters. If no VLAN Id exists for a data port, VLAN is disabled for that port.

1 Follow the Preliminary steps

2 Click on the **Ethernet** menu item.

3 The **Ethernet Port Configuration** page appears. Add a VLAN ID number and name in the appropriate boxes.

4 Press **Submit.**

5 Go to the **Restart** page and restart the iPBridge.

After rebooting, Virtual LAN takes effect.

Enhance performance

Note

If you used ExpressWizard to set up your iPBridge, changing these parameters may interfere with ExpressWizard settings.

Default values, even if you have not used the ExpressWizard, are appropriate for most configurations, but may be modified.

1 Follow the Preliminary steps.
2 On the **iSCSI** page, enable **SpeedWrite.**
3 On the **Ethernet** page, change **MTU** to **9014.**

Note

If you change the MTU on the iPBridge, you must enable jumbo frames on your initiator and change the MTU on the initiator.

4 For Windows operating systems, use the ATTO iSCSI performance configuration tool (Windows only).

iSCSI performance configuration tool (Windows only)

The ATTO iSCSI performance configuration tool changes the Windows registry parameters for Microsoft iSCSI Initiator and TCP/IP to enhance overall data throughput.

1 From the CD which came with your iPBridge, copy the **Perftune.exe** file to your hard drive.
2 Execute the program.
3 Click on **Use ATTO Performance Settings**. Settings take effect on the next system reboot.

The following settings are affected:

FirstBurstLength

The maximum amount, in bytes, of unsolicited data an iSCSI initiator may send to the target during the execution of a single SCSI command including the immediate data and the sequence of unsolicited Data-Out PDUs which follow the command. ***FirstBurstLength*** *cannot exceed MaxBurstLength*

ATTO value: 1048576 decimal 00100000 hex

MaxBurstLength

The maximum SCSI data payload, in bytes, in a Data-In or a solicited Data-Out iSCSI sequence. A sequence consists of one or more consecutive Data-In or Data-Out PDUs that end with a Data-In or Data-Out PDU with the F bit set to one.

ATTO value: 1048576 decimal 00100000 hex

MaxRecvDataSegmentLength

The maximum data segment length, in bytes, that a transmitter (initiator or target) can receive in an iSCSI PDU. The transmitter is required to send PDUs with a data segment that does not exceed ***MaxRecvDataSegmentLength*** *of the receiver.*

ATTO value: 1048576 decimal 00100000 hex

MaxTransferLength

The maximum number of bytes that may be transferred by a single SCSI request block (SRB).

ATTO value 1048576 decimal 00100000 hex

SrbTimeoutDelta

The maximum amount of time, in seconds, before an SRB request will time out.

ATTO value 300 decimal 0000012c hex

Tcp1323Opts

This parameter controls RFC 1323 time stamps and window-scaling options. Time stamps and window scaling are enabled by default, but can be manipulated with flag bits. Bit 0 controls window scaling and bit 1 controls time stamps.

ATTO value: 1

4 Remote system monitoring

You may set up the iPBridge to send notifications when certain events occur.

You may set up the iPBridge to send notifications when certain events occur using the **Remote Management** page of the ExpressNAV interface.

You designate the person receiving notification of conditions and the level of severity which prompt notification using the Simple Network Management Protocol (SNMP).

For both methods, the severity level which is report can be **critical, warning or all**.

- **Critical** means only critical event notifications are sent.
- **Warning** means only warnings and critical event notifications are sent.
- **All** means warnings, critical events and informational messages are sent.

SNMP

An agent resides in the iPBridge which takes information from the iPBridge and translates it into a form compatible with SNMP. If certain conditions arise, the agent sends notifications (traps) to a client.

Contact your network administrator for the MIB software and appropriate MIB file for your iPBridge.

1 Follow the Preliminary steps on page 13.

2 Click on **Remote Mgt** from the side menu. The **Remote Management** page appears.

3 In the **SNMP** line, click on the **enabled** button.

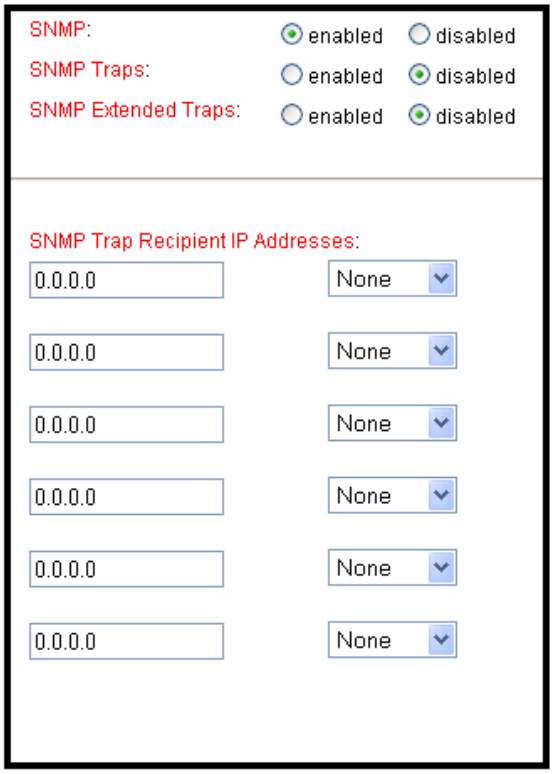
4 In the **SNMP Traps** or SNMP **Extended Traps** line, click on **Enable.** For details, refer to SNMPTraps and SNMPExtendedTraps on page xi of the Appendix.

5 In the **SNMP Trap Recipient IP addresses** section, enter the IP address of each person you want to notify.

6 From the drop-down box next to each trap address, select the level of severity for which you want each address to be notified: **None**, **All**, **Critical** or **Warning**.

7 Click on **Submit.**

8 Go to the **Restart** page and restart the iPBridge. After rebooting, the iPBridge sends notifications as you set them up.



5 Updating firmware

Several processors control the flow of data in the ATTO iPBridge. The firmware to control these processors can easily be upgraded in the field.

The iPBridge firmware is distributed as an .ima file can be obtained from the ATTO Technology, Inc. web site at **www.attotech.com** or from the CD included with your iPBridge.

CAUTION

Before beginning this procedure, ensure that all I/O to the iPBridge has stopped.

During this procedure, *do not* interrupt the flash process.

***Do not* power down the host or the iPBridge until the display returns the Ready prompt.**

Interrupting the flash process will make your iPBridge inoperable and you must return it to ATTO Technology for repair.

Using ATTO ExpressNAV

1. If you have not already, open an ExpressNAV session. For instructions, refer to Opening an ExpressNAV session on page 23.
2. Click on the **Firmware** page.
3. Click **Browse** and locate the firmware you downloaded from the website or from the CD. A sample filename:

```
c:\bridge_firmware\ibrg0370.ima
```

4. Click **Upload** and wait until a success message is displayed.
5. Click the **Restart** link.
6. Click on **Restart**.

Using FTP

1. Establish an FTP link to the bridge that is to be flashed.
2. Use the **PUT** command to download the firmware file. A sample filename:

```
c:\bridge_firmware\ibrg0370.ima
```

3. Once the download is complete, cycle power on the iPBridge to activate the new firmware.

6 Troubleshooting

If it is clear that a particular component system is at fault in a problem situation, go directly to that component. If it is not clear, the best approach is to troubleshoot using the inside-out method.

You may check on the status of your iPBridge using the ExpressNAV interface. You may also look for information by using the diagnostic CLI commands, enumerated in CLI provides an ASCII-based interface on page iii, in the **Advanced** page of the ExpressNAV interface or by using the CLI directly.

To start and use the ExpressNAV interface, including how to access the version information, refer to Opening an ExpressNAV session on page 23.

Inside out method

To troubleshoot using the inside out method, begin with the device(s) connected to the iPBridge first, then work your way out.

- SCSI devices
  - iPBridge SCSI port
    - iPBridge internal configuration
      - iPBridge Ethernet/IP port
        - LAN/WAN
          - Ethernet host adapter or NIC in host
            - Initiator
              - OS
                - Application

Check basic diagnostic tools

Check the host event log

Check the event log on the host. Look for the most recent entries and determine what could be causing a problem, then go to that event and continue troubleshooting.

Check the iPBridge event and trace logs

Check the iPBridge event log through the CLI. Look for the most recent entries and determine what could be causing a problem. Then go to that event and continue troubleshooting.

Visually inspect LEDs

Light Emitting Diodes (LEDs) are located the back of the iPBridge.

Each SCSI bus has its own LED which lights when the iPBridge is ready and blinks steadily when there is SCSI activity.

Check for problems on attached devices

Check the following in order to find problems on attached devices:

- LEDs
- Display panels
- Firmware levels
- Operability

Check host versions

Check the following to find problems on attached hosts:

- Operating system version
- Service pack version
- Host adapter version
- Host adapter firmware version
- Host adapter device driver version
- iSCSI driver version

If an update is required, perform the update. For an updated list of supported iPBridge host

platforms and host adapters, visit **www.attotech.com.**

Check iPBridge product versions

For a current list of required updates, visit **www.attotech.com**.

1. If you have not already, open an ExpressNAV session.
2. Go to the **Status** page and check the version number.
3. If you need to update, download the update from **www.attotech.com.**
   Refer to Updating firmware on page 16.

Check components

Check SCSI devices

1. Check SCSI devices to make sure they are all set to different SCSI IDs.
   By default, the iPBridge SCSI port uses SCSI ID 7 so drives should use IDs 0 through 6 and 8 through 15.
2. Check the SCSI device power. Make sure the devices are powering up.
3. Watch the drive lights before, during, and after startup. Many drives have term power lights that should be on before startup and turn off when system boots.
4. Verify the external terminator is the correct type and does not have damaged pins.
5. Check cable integrity. Check the cables for solid connections. Make sure they are screwed down. Inspect cable ends for bent pins.
6. If termination is correct, and the problem persists, try drives one at a time with different cables, adding drives and cables until the problem occurs. This helps pinpoint the drive or cable causing the problem.
7. Check with the manufacturer of SCSI device(s) for further troubleshooting methods.

If SCSI devices appear to be working, continue to the iPBridge SCSI port section.

Check the iPBridge SCSI port

1. Verify the iPBridge has its termination set properly. By default, termination is `enabled`.
2. Perform a SCSI bus scan on each SCSI port.
   If no devices appear, re-check SCSI cables and termination. If garbage information appears, the problem is most likely a bad SCSI cable or termination.
3. Check the internal cabling of the SCSI device. LVD SCSI cable lengths are limited to 12.5 meters. Longer cable lengths can cause problems. Internal cabling is also considered when calculating total cable length. For details, refer to Cabling on page i of the Appendix.
4. Some older SCSI devices improperly negotiate with the iPBridge SCSI port. If older devices are not showing up, contact your service representative.
5. If all devices appear, invoke the **ScsiTargets** command several times on each SCSI port to verify that the devices can be seen. If devices disappear then appear again, the problem is most likely a SCSI cable.

If all devices appear and remain, move to the iPBridge internal configuration section.

When changing any setting on the iPBridge the configuration must be saved by using either the **saveConfiguration** CLI command or through the ATTO ExpressNAV interface.

Check the serial port

1. Verify you have the correct settings and that your terminal is configured to:
   - Baud rate: 115200
   - Data bits: 8
   - Stop bits: 1
   - Parity: off
   - Flow control: None
   - Echo: disabled
2. Verify that your serial cable is less then two meters in length.

Check the iPBridge internal configuration

Verify that the SCSI devices are mapped properly. Check in the ATTO ExpressNAV interface or use the **routedisplay iSCSI** command to show mappings. If devices do not appear, power down the iPBridge and power back on. Refer to Target management on page 9.

When changing any setting on the iPBridge, the configuration must be saved.

Check the iPBridge Ethernet port

1 Check Ethernet cable integrity. Check the cables for solid connections. Cat5 cable can cause connection issues with Gigabit Ethernet. Cat6 cable is the best cabling for the iPBridge.
2 Verify the IP address, subnet mask, and gateway are properly set on each data port on the iPBridge for your network environment. Refer to Installation on page 5.
3 Verify that the Ethernet speed is set to auto: invoke the **get EthernetSpeed all** command, check the **Ethernet** page of the ATTO ExpressNAV interface, or check the LED link lights to determine if the Ethernet speed is correct.
4 Determine if the iPBridge is set to get its IP information from a DHCP server. If so, verify that the DHCP server has available IP addresses. Refer to Installation on page 5.
5 Verify that each used Ethernet port on the iPBridge can be pinged from the desired host. Refer to Ping on page ix of the Appendix.
If the host cannot ping the iPBridge port and the iPBridge port is properly configured, continue to the Local Area Network/Wide Area Network section, Check the LAN/WAN on page 19.
Verify that each port on the iPBridge can ping each desired host. Refer to Ping on page ix of the Appendix. If the iPBridge cannot ping the host, continue to Check the LAN/WAN on page 19.
6 If using DHCP, verify that the DHCP server is assigning the correct IP information to the host.
7 Some older switches/hosts cannot auto negotiate between the iPBridge and the switch/host at the desired speed. You may have to force the host/switch or the iPBridge to the desired speed.
8 Verify that the host is logging into the iPBridge correctly by viewing the **Connections** page and determining if there a “session open” status.
9 Verify that you are using the correct log in procedure for your initiator. For example: When connecting using the Adaptec initiator, the log on screen requests the iPBridge iqn (iSCSI qualified name). If left blank, Adaptec cannot log in. Enter “iSCSI” into this field for auto iqn discovery.

When changing any setting on the iPBridge the configuration must be saved by using either the **saveConfiguration** CLI command or through the ATTO ExpressNAV interface.

Check the LAN/WAN

1 Verify that the switch/switches are segmented properly so that hosts and the iPBridge have access to each other.
2 If there are routers involved in the setup, make sure the IP addresses and/or MAC addresses of the iPBridge are allowed through the router.
3 Verify that the switch can see the iPBridge on the port(s) in question. Refer to your switch vendor’s guide for more information.

Check the iSCSI Host Adapter or NIC

iSCSI host adapters appear as a type of Storage Controller to the host OS, not as a standard NIC. These adapters usually have hardware acceleration to offload the TCP processing from the host. Configuration of these adapters is usually done through the vendor’s own utility and not through the OS itself.

NICs come in two types: accelerated and un-accelerated. Accelerated NICs use some hardware to offload some of the TCP processing from the host. Un-accelerated NICs make the OS do all TCP processing.

To check the iSCSI host adapter or NIC

1 Check cable integrity. Check the cables for solid connections. Make sure they are plugged in properly. Inspect cable ends for broken clips and improper wiring.
2 Verify that the iSCSI host adapter or NIC is configured with the correct IP information.
3 If using DHCP, verify that the DHCP server is assigning the correct IP information to the host.
4 Verify that the hosts are running the recommended driver and firmware level for the iSCSI host adapter or NIC vendor.
5 Verify that the hosts and the iPBridge are using the same port number to communicate via iSCSI. The default port number for the iPBridge is 3260.
6 Make sure the host adapter/NIC is configured to log into the iPBridge. Some iSCSI host adapters do not re-login upon reboot or unplug/replug event without marking a check box.

7 Some older switches cannot autonegotiate between the host and the switch properly. You may have to force the host or switch to the desired speed.

For a NIC using an OS iSCSI driver, continue to the iSCSI OS driver section.

Check the iSCSI OS driver

This section is for hosts using a driver that allows the OS to talk to iSCSI targets via a NIC, not an iSCSI storage adapter.

1 A PC using an iSCSI storage adapter and an iSCSI OS driver might not work correctly on the same machine. Check with the vendors to make sure they are compatible.
2 Verify that the PC has the latest iSCSI driver as well as the required service packs and patches. Check with the iSCSI OS driver vendor for more information.
3 Verify that the iSCSI OS driver has started. Look under **Device Manager** for Windows or **lsmod** for Linux.
4 Verify that the iSCSI OS is still looking for the iPBridge at the right IP address.
5 If using DHCP, verify that the DHCP server is assigning the correct IP information to the host.
6 Verify that the NIC is configured with the correct IP information.
7 Verify that the hosts and the iPBridge are using the same port number to communicate via iSCSI. The default port number for the iPBridge is 3260.
8 Check cable integrity. Check the cables for solid connections. Make sure they are plugged in properly. Inspect cable ends for broken clips and improper wiring.

Check the Operating System

1 Verify that the OS has the required service packs or patches installed. If not, obtain the proper service packs and patches and install them.
2 Some iSCSI host adapters and iSCSI OS drivers do not always automatically find new targets when plugged in or when forced to rescan. Reboot the hosts.
3 Check if the vendor has a new driver. If so, install it.

Check the applications

1 Verify that the application is running the latest device drivers for the devices connected to iPBridge. If not, get the latest device drivers and install them.
2 Verify with the application vendor if the iSCSI technology is supported on the version of the application being used.

Performance issues

If the host is not getting the performance it should, check the following items.

Check SCSI devices

1 Verify that the devices are running at their highest possible SCSI speed.
Mixing SE and LVD devices on the same SCSI bus forces the speed of the bus to SE, thus slowing faster LVD devices. The iPBridge cannot accelerate an already slow device. Refer to Connecting SCSI devices to the SCSI port on page ii of the Appendix.
2 Verify that the proper terminator is being used. An SE terminator forces the SCSI bus to SE speeds.

Check the iPBridge SCSI port

1 Verify that the SCSI port configuration is set to the highest speed using the ExpressNAV interface, **SCSI** page.
The iPBridge SCSI port speed, wide negotiation, and sync negotiation settings all affect the speed of the port. By default, these settings are set for optimal speed.

Check the iPBridge Ethernet port

1 Verify that the data port is set to auto negotiate or forced to 1000 Mb.
2 Verify that the MTU size is set to optimal setting for the LAN/WAN environment.
The current optimized frame size for the iPBridge is 9k.

Check the LAN/WAN

1 Verify that the MTU size is set to optimal setting for the LAN/WAN environment.
9k frame size is the current optimized frame size for the iPBridge. Many switch and router vendors do not support the larger frame size of 9k or 16k.

2 Verify that each associated port in the IP SAN is configured for 1000Mbs.
IP SAN traffic should be segmented so that it does not interfere with the main LAN network traffic.For better performance, the IP SAN should be on its own set of hardware.

3 Verify that packets are not being dropped along the LAN/WAN. Many utilities track packet activity and switch statistics.

Check the Ethernet Host Adapter or NIC

Ethernet Storage Adapters generally outperform accelerated NICs and un-accelerated NICs by offloading most of the processing from the host.

An accelerated NIC provides some offloading, but still requires a host OS iSCSI driver, making the host spend more CPU cycles.

An un-accelerated NIC does not offload anything so the CPU must do much of the processing.

To check the Ethernet host adapter or NIC

1 Verify that the adapter or NIC is sent to auto-negotiate or forced to 1000 Mb.

2 Set the MTU size to the largest MTU size supported in the LAN/WAN.
9k frame size is the current optimized frame size for the iPBridge. Many switch and router vendors do not support the larger frame size of 9k or 16k. Set the maximum transfer size to the most efficient size for the intended target(s). For many tape drives, 64k is the optimal setting.

Check the applications

Some applications can be configured to change transfer sizes. Configure the application for the optimal size for the particular SCSI device(s) connected to the iPBridge.

Check the host system

The faster the host, the faster your transfer times are. The work flow goes only as fast as the slowest connection in the host system, so transferring data from an IDE drive, 100Mb connection, a DLT 4000, a high speed RAID volume across the country, or other applications, slows the system no matter how fast everything else is in the system.

1 Verify that the iSCSI storage adapter or NIC is connected to the fastest PCI bus connector supported by the adapter or NIC.
If the adapter supports PCI-X, place the adapter in a PCI-X slot. If one is not available, the host might not achieve the optimal performance capable from the adapter.
Even placing a PCI-X adapter into a 64 bit 66 MHz slot loses performance. Some adapters adjust clock speed depending on the speed of the PCI slot into which they are plugged.

2 The host OS disk and swap disk/partition/file should be on a high speed drive such as a SCSI drive to minimize the time needed to access the host's virtual memory.
The more memory a system has, the less time it spends accessing virtual memory (hard drive space).

Check the Operating System

If possible, eliminate swap space and virtual drives which require large amounts of system memory. However, the OS might not allow the elimination of swap space. An OS set to run many kinds of different servers spends much of its CPU cycle on other operations, thus slowing down performance.

Use the ATTO iSCSI performance configuration tool (Windows only)

The ATTO iSCSI performance configuration tool changes the Windows registry parameters for Microsoft iSCSI Initiator and TCP/IP to enhance overall data throughput.

1 From the CD which came with your iPBridge, copy the **Perftune.exe** file to your hard drive.

2 Execute the program.

3 Click on **Use ATTO Performance Settings**. Settings take effect on the next system reboot.

The following settings are affected:

FirstBurstLength

The maximum amount, in bytes, of unsolicited data an iSCSI initiator may send to the target during the execution of a single SCSI command including the immediate data and the sequence of unsolicited Data-Out PDUs which follow the command. ***FirstBurstLength*** *cannot exceed MaxBurstLength*

ATTO value: 1048576 decimal 00100000 hex

MaxBurstLength
The maximum SCSI data payload, in bytes, in a Data-In or a solicited Data-Out iSCSI sequence. A sequence consists of one or more consecutive Data-In or Data-Out PDUs that end with a Data-In or Data-Out PDU with the F bit set to one.

ATTO value: 1048576 decimal 00100000 hex

MaxRecvDataSegmentLength
The maximum data segment length, in bytes, that a transmitter (initiator or target) can receive in an iSCSI PDU. The transmitter is required to send PDUs with a data segment that does not exceed ***MaxRecvDataSegmentLength*** *of the receiver.*

ATTO value: 1048576 decimal 00100000 hex

MaxTransferLength
The maximum number of bytes that may be transferred by a single SCSI request block (SRB).

ATTO value 1048576 decimal 00100000 hex

SrbTimeoutDelta
The maximum amount of time, in seconds, before an SRB request will time out.

ATTO value 300 decimal 0000012c hex

Tcp1323Opts
This parameter controls RFC 1323 time stamps and window-scaling options. Time stamps and window scaling are enabled by default, but can be manipulated with flag bits. Bit 0 controls window scaling and bit 1 controls time stamps.

ATTO value: 1

Optimize ATTO ExpressNAV in Internet Explorer

1. Go to the browser toolbar and select **Tools**
2. Select **Internet Options**
3. Select the **Security** tab
4. Select the **Custom Level** button.
5. On the menu presented, go to the **Microsoft VM, Java permissions** and make sure **Disable Java** is *not* selected.
6. Go to the **Miscellaneous** topic and select **METAREFRESH**.

Reset to factory defaults

A manual reset switch is mounted on the back panel. Insert a tool in the hole in the back panel to activate the switch, wait until the Activity LED on the top of the iPBridge becomes green, then cycle power. The iPBridge is reset to factory defaults.

7 Interface options

Alternative methods to the ATTO ExpressNAV interface may be used to manage the iPBridge. ATTO ExpressNAV is the recommended interface.

Using ExpressNAV

Each page in the ATTO ExpressNAV interface provides information and/or configuration parameters based on a specific topic.

ATTO ExpressNAV is the recommended management tool for the iPBridge. It is a web-based graphical user interface (GUI) that allows you to manage the iPBridge by clicking choices and commands in traditional GUI fashion or by entering CLI commands directly, as you would in a terminal emulation session, on the **Advanced CLI** page.

Opening an ExpressNAV session

1 Point your browser at the IP address of the iPBridge. Refer to Discovering the IP address. on page 5.

2 The **ExpressNAV** home page is displayed. Click **Enter**.

3 Enter the user name and password values.

Note

*The default values are user name: **root** and password: **Password**. The user name is case insensitive and password is case sensitive. It is best practice to change user names and passwords. Refer to Modify passwords on page 13.*

The **Status** page appears.

Each page can be reached through the menu at the side of each page. An image on each page's header shows each port in the product faceplate. Each port is clickable and takes you to the appropriate page.

If you have completed configuration operations at any time and have clicked **Submit** on the page you are viewing, go to the **Restart** page and restart the iPBridge to save the settings.

If you have not completed configuration changes, go on to the next command.

Optimizing ExpressNAV in Internet Explorer

1 Go to the browser toolbar and select **Tools**
2 Select **Internet Options**
3 Select the **Security** tab
4 Select the **Custom Level** button.
5 On the menu presented, go to the **Microsoft VM, Java permissions** and make sure **Disable Java** is *not* selected.
6 Go to the **Miscellaneous** topic and select **METAREFRESH**.

Using the serial port

1 Connect a cable from iPBridge RS-232 serial port to the serial (COM) port on a personal computer.
2 Turn on the iPBridge.
3 Start a terminal emulation program on the personal computer, and use it to connect to the iPBridge. For example, if you are using HyperTerminal on a computer running a Windows operating system,
   a. Type **iPBridge** in the **New Connection** dialog box.
   b. Click **OK**.
   c. In the **Connect To** dialog box, for the **Connect using field** select the COM port number to which your serial cable is connected.
   d. Click **OK**.
   e. In the COM Properties dialog box select the following values:
   - Bits per second: 115200
   - Data Bits: 8
   - Parity: None
   - Stop Bits: 1
   - Flow Control: None
   - Terminal type: ASCII
   - Echo: off

   f. Click **OK.**
4 After you connect to the iPBridge, start-up messages are displayed. These messages are

only displayed at start-up. The last line in the start-up message sequence is **Ready**.

5 In serial port sessions, there is no prompt on the line below the word **Ready**. Begin typing commands in the blank line where the cursor is resting. No user name or password is required for serial port access.

6 To verify that you have connected successfully, type **help** after the **Ready** prompt and press **Enter.**

- If a list of all available commands does not appear on the screen, review the steps in this section, check the cable, or contact service personnel until the problem is solved.

If you have difficulty using the serial port, verify that you have the correct settings and that your serial cable is less then two meters in length.

Using Telnet

Up to three Telnet sessions can be conducted simultaneously. A serial port session can use the CLI while Telnet sessions are open. Whichever session issues the first **set** CLI command can continue to issue set commands, while the other sessions can only issue **get** commands or display information. Once a connection is established, refer to CLI provides an ASCII-based interface on page iii of the Appendix.

1 Connect to the iPBridge from a computer on the same Ethernet network.

2 Start a Telnet session.

Note

There is more than one way to connect to the iPBridge using a telnet program.Your telnet program may operate differently than in the following instructions.

3 At the telnet prompt, issue the **open** command where x.x.x.x is the IP address of the iPBridge.

```
telnet > open x.x.x.x
```

4 If you have to specify a port type, enter the port type “telnet” and the terminal type “vt100”.

```
port type: telnet
terminal type: vt100
```

5 Enter the default values for the user name, **root**, and the password**, Password**, if you did not set new values in Modify passwords on page 13.

Appendix A Cabling

Additional information to physically connect ports to devices and to your SAN.

SCSI cabling

Cables and devices must be chosen to maximize performance and minimize the electrical noise from the high-speed data transfers available with the SCSI protocol. Cabling and termination methods become important considerations for proper performance. SCSI cables and devices are subject to specific length and number limitations to deal with electrical problems that arise at increased operating speeds.

Cable types

Use high-quality cables rated for the type of SCSI transfers required: well-insulated SCSI cables ensure error free communications. Try to keep cable lengths as short as possible to ensure higher signal quality and performance.

Examples

The SCSI specification limits total bus cable length for single-ended SCSI in a non-UltraSCSI environment to 3 meters (combined length of both internal and external cable lengths).

In an UltraSCSI workgroup environment with a 7-drive tower, you are limited to 1.5 meters between the host and the tower, including the cabling for the tower. If the 7-drive tower requires 1 meter of cabling to connect all of its drives, the distance from the tower to the host must be .5 meters.

Note

UltraSCSI is very sensitive to SCSI bus noise, cable distances and the number of devices connected on the SCSI bus. Carefully connect your devices when working with UltraSCSI.

Exhibit A-1 Various types of SCSI operate at different speeds and require different bus lengths to support a certain number of devices.

STA terms	Bus speed MB/sec. max.	Bus width bits	Max. bus lengths in meters			Max. device support
			Single-ended	Differential	LVD	
Fast SCSI	10	8	3	25	n/a	8
Fast/WIDE SCSI	20	16	3	25	n/a	16
UltraSCSI	20	8	1.5	25	n/a	8
Ultra/WIDE SCSI	40	16	n/a	25	n/a	16
WIDE Ultra SCSI	40	16	1.5	n/a	n/a	8
WIDE Ultra SCSI	40	16	3	n/a	n/a	4
Ultra2 SCSI	40	8	n/a	n/a	12	8
WIDE Ultra2 SCSI	80	16	n/a	n/a	12	16
Ultra 160 SCSI	160	16	n/a	n/a	12	16
Ultra 320 SCSI	320	16	n/a	12	n/a	16

Connecting SCSI devices to the SCSI port

ATTO iPBridge SCSI ports connect SCSI storage devices to the network.

The SCSI port is a bus capable of supporting 15 devices and each bus is capable of 40, 80, 160 or 320 MB/sec. (Ultra, Ultra2 or Ultra320) transfer rates.

The iPBridge supports a wide variety of SCSI storage devices including stand-alone drives, removable drives, JBODs, RAIDs, tape, CD and DVD drives, changers and libraries.

1 Connect the cable from the SCSI device to a VHDCI SCSI port on the iPBridge.

2 Check the type of cable, cable length limit and number of devices recommended for the port. See Exhibit 1.

Keep cable lengths as short as possible to ensure the highest signal quality and performance. These cable lengths include the wiring inside the devices.

3 Set the IDs of the SCSI devices connected to the bridge to a value other than 7.

Use a sequential ID starting at 0 for each device. The SCSI port in the ATTO iPBridge has an internal factory setting ID of 7, typical for a SCSI initiator device.

4 Terminate the SCSI bus after the last device. The iPBridge is terminated internally.

Ethernet connections

Use at least Cat 5e cable to connect the Ethernet port to your network.

Note

For best performance, all cabling, network interface cards (NICs), host bus adapters (HBAs), and network switches must be Gigabit Ethernet (GbE), and at least Cat 5e certified. Most standard offices use 2-pair wiring which is not compatible. GbE requires 4-pair wiring.

For best performance, support for 9014 byte jumbo frames should be available for all switches and host iSCSI equipment.

Before you begin installing the iPBridge Ethernet port, be sure to check or complete the following:

- If you are managing your iSCSI system across a WAN and your system uses a firewall, be sure that the following ports are open and available:

  If you are using the TCP protocol
  - telnet (port 23)
  - http (port 80)
  - ftp (ports 20 and 21)
  - iSCSI (port 3260)
  - iSNS (port 3705)

  If you are using the UDP protocol
  - ntp (port 123)
- Be sure your host system(s) is set up and configured.
  - Your host system can use any of three different types of cards: a network interface card (NIC), a telnet offload engine card (TOE), or a storage network interface card (SNIC).
  - The ATTO driver file from the CD included with your iPBridge or from the ATTO website, **www.attotech.com**, is installed on your host.
  - The switch has been configured to forward UDP broadcast messages.
- The minimum requirement for Windows-based browsers is Internet Explorer 5.5 or Netscape Navigator 6.2. The minimum requirement for Macintosh browsers is Internet Explorer 5.2 or Safari 1.2.
- Ethernet speed defaults to auto; the iPBridge determines the speed and set other parameters based on the speed.

Appendix B CLI provides an ASCII-based interface

The command line interface (CLI) uses ASCII commands typed while in CLI mode.

CAUTION

Do not use CLI unless you are directed to by an ATTO technician.

Changing parameters may cause loss of data and/or disruption to performance and reliability of the iPBridge.

The ExpressNAV interface is the preferred method to operate and manage the iPBridge. Refer to Interface options on page 23 for details.

The command line interface (CLI) is a set of ASCII-based commands which perform configuration and diagnostic tasks. Refer to Interface options on page 23.

- CLI commands are context sensitive and generally follow a standard format
- [Get|Set] Command [Parameter1|Parameter2] followed by the **return** or **enter** key
- CLI commands are case insensitive: you may type all upper or all lower case or a mixture. Upper and lower case in this manual and the **help** screen are for clarification only.
- Commands generally have three types of operation: get, set and immediate.
- The get form returns the value of a parameter or setting and is an informational command.
- Responses to get commands are followed by **Ready**.
- The set form is an action that changes the value of a parameter or configuration setting. It may require a **SaveConfiguration** command and a restart of the system before it is implemented. The restart can be accomplished as part of the **SaveConfiguration** command or by using a separate **FirmwareRestart** command. A number of set commands may be issued before the **SaveConfiguration** command.
- Responses to **set** commands are either an error message or **Ready. *.** The asterisk indicates you must use a **SaveConfiguration** command to finalize the **set** command.
- Set commands which do not require a **SaveConfiguration** command, defined as immediate commands, are immediately executed.

Note

Using certain CLI commands during normal operation can cause a performance drop. Once command actions are complete, performance should return to normal levels.

Exhibit A-2 Symbols, typefaces and abbreviations used to indicate functions and elements of the command line interface used in this manual.

Symbol	Indicates
[ ]	Required entry
< >	Optional entry
|	pick one of
-	a range (6 – 9 = 6, 7, 8, 9)
sb	SCSI bus number (n=1)
sl	SCSI LUN ID (0 <= sl <=63)
st	SCSI target ID (0 <= st <= 15)
dp1	Ethernet port used to manage the iPBridge

CLI error messages

The following error messages may be returned by the Command line Interface

```
ERROR. Invalid Command. Type 'Help' for command list.
ERROR. Wrong/Missing Parameters
Usage: <usage string>
```

CLI summary

The following chart summarizes the Command Line Interface commands, their defaults, and an example of how to enter the commands. Commands which have no default values have a blank entry in that column of the table.

CAUTION

Do not use CLI unless you are directed to by an ATTO technician.

Changing parameters may cause loss of data and/or disruption to performance and reliability of the iPBridge.

The ExpressNAV interface is the preferred method to operate and manage the iPBridge. Refer to Interface options on page 23 for details.

Command	Default	Example
AccessControl	disabled for default node enabled for all other nodes	set accesscontrol default enabled
AccessEntry		set accessentry discovery all delete
AutoMap		automap
AutoMapOnBoot	enabled	set automaponboot disabled
AutoMapOnBootDelay	0	set automaponbootdelay 20
BridgeModel		get bridgemodel
BridgeName	iPBridge	set bridgename Omega6
ClearEventLog		clearеventlog
Date		set date 03/03/2003
DeleteAllMaps		deleteallmaps
DPMTU	1514	set dpmtu 9014
DumpConfiguration		dumpconfiguration
DumpEventLog		dumpeventlog
EthernetSpeed	auto	set ethernetspeed dp1 100
Exit		exit
FirmwareRestart		firmwarerestart
Help		help automap
IdentifyBridge	disabled	set identifyBridge enabled
Info		info
IPAddress	10.0.0.1	get ipaddress dp1
IPDHCP	enabled	set ipdhcp dp1 disabled
IPGateway	0.0.0.0	get ipgateway dp1
IPSubnetMask	255.255.0.0	get ipsubnetmask dp1
iSCSIAlias	“ “	set iscsialias diamond
iSCSIChap	disabled	set iscsichap default enabled

Command	Default	Example
iSCSIChapSecret		set iscsichapsecret default in iqn.1991-05.com.microsoft:barbpc barb123
ISCSIInitiators		iscsiinitiators
iSCSIPortNumber	3260	get iscsiportnumber dp1
iSCSITarget		iscsitarget alpha1
iSCSITargetNameDisplay		iscsitargetnamedisplay
iSCSIWANIPAddress	0.0.0.0	set isciwanipaddress dp1 172.21.22.1
iSNSLoginControl	disabled	set isnslogincontrol enabled
iSNSServer	0.0.0.0	get isnsserver
IsReserved		isreserved
Password	Password	set password
Ping		ping dp1 192.42.155.155
ReadOnlyPassword	Password	set readonlypassword
ReadOnlyUsername	user	get readonlyusername
Reserve		reserve
RestoreConfiguration		restoreconfiguration default
RMON	see Exhibit A-3 on page xiii of the Appendix	get RMON ethernethistory
Route		route iscsi default 2 scsi 1 1 1
RouteDisplay		routedisplay iscsi
SaveConfiguration		saveconfiguration restart
SCSIDomainValidation		scsidomainvalidation
SCSIInitId	0x07	set scsiinitid 1 12
SCSIPortBusSpeed	ultra320	set scsiportbusspeed 1 ultra160
SCSIPortList		scsiportlist
SCSIPortReset		scsiportreset 1
SCSIPortResetOnStartup	enabled	set scsiportresetonstartup 1 disabled
SCSIPortSyncTransfer	enabled	set scsiportsynctransfer 1 disabled
SCSIPortTermination	enabled	set scsiporttermination 1 enabled
SCSIPortWideTransfer	enabled	set scsiportwidetransfer 1 disabled
SCSITargetLUNs	8	set scsitargetluns 1 64
SCSITargets		scsitargets 1
SerialNumber		get serialnumber
SerialPortBaudRate	115200	set serialportbaudrate 19200
SerialPortEcho	enabled	get serialportecho
SNMP	enabled	set snmp disabled
SNMPDumpMIB		snmpdumpmib
SNMPExtendedTraps	disabled	set snmpextendedtraps enabled
SNMPTrapAddress	iPAddress = 0.0.0.0 level = none	set snmptrapaddress 6 192.42.155.155 all
SNMPTraps	disabled	set snmptraps enabled
SNTP	enabled	get sntp
SNTPServer	192.43.244.18	set sntpserver 129.6.15.28
SpeedWrite	disabled	set speedwrite scsi all enabled
SpeedWriteDefault	disabled	get speedwritedefault

Command	Default	Example
TailEventLog		taileventlog
Time	00:00:00	set time 03:32:30
TimeZone	EST	set timezone pst
Username	root	set username barbara
VerboseMode	enabled	set verbosemode disabled
VirtualDriveResponse	disabled	get virtualdriveresponse
VLAN		set vlan dp1 5 alpha1

Alphabetical CLI command explanations

AccessControl

Controls access on a target node. Access to the target node is keyed to the iSCSI qualified name of listed initiators.

Note

AccessControl cannot be used with iSNS.

Default: disabled on the default node; enabled on all other nodes
set AccessControl [default | Target Name] [enabled | disabled]
get AccessControl [default | Target Name]

AccessEntry

*Allows the addition or deletion of an initiator entry from the access control list of a target node. The initiator name must be formatted as an iSCSI qualified name and must be between 1 to 223 characters, is case sensitive and cannot be **all**.*

Default: default all
set AccessEntry [default | Target Name | discovery] [Initiator Name <delete> | all [delete]]
get AccessEntry [default | Target Name | discovery]

AutoMap

*Automatically maps all target devices visible to the iPBridge to iSCSI addresses. If you use no arguments, all devices are mapped to the default target. If you specify a target, all devices are mapped to that target. If you specify *****, each device is mapped to its own auto-named target.*

Automap <default | * | target name>
SaveConfiguration command required

AutoMapOnBoot

Regulates automatic device detection and mapping (AutoMap) at startup.

Default: enabled
set AutoMapOnBoot [enabled | disabled]
get AutoMapOnBoot

AutoMapOnBootDelay

Specifies the duration of time in seconds that the iPBridge waits before performing an AutoMapOnBoot operation. AutoMapOnBoot must be enabled for the specified delay to take effect.

Default: 0
set AutoMapOnBootDelay [0 - 256]
get AutoMapOnBootDelay

BridgeModel

Reports specific model and firmware information.

get BridgeModel

BridgeName

Specifies the eight-character ASCII name assigned to the iPBridge to identify individual units. It is not the World Wide Name. Changes take effect immediately.

set BridgeName [name]
SaveConfiguration Restart command required
get BridgeName

ClearEventLog

Clears the contents of the event log. No new entries are recorded until the operation is completed.

ClearEventLog

Date
Regulates the current date for this iPBridge. The date range is 1/1/2000 to 12/31/2099.

set Date [MM] / [DD] / [YYYY]
get Date

DeleteAllMaps
Removes all mapped devices from the map table. Upon the subsequent POST, the default maps are loaded if no maps are present.

DeleteAllMaps
SaveConfiguration command required

DPMTU
Controls the MTU, or maximum transmission unit, used by the data port.

default: 1514
set DPMTU [dp1 | all] [1514 | 9014]
get DPMTU [dp1 | all]

DumpConfiguration
*Displays the iPBridge configuration to the ExpressNlAV **Advanced** page text box, an available RS-232 or telnet session.Results may be truncated in the ExpressNAV readout.*

DumpConfiguration

DumpEventLog
*Dumps the entire contents of the event log to the ExpressNlAV **Advanced** page text box, an available RS-232 or telnet session.Results may be truncated in the ExpressNAV readout.*

DumpEventLog

EthernetSpeed
*Regulates the speed of the iPBridge Ethernet port. If **Auto** is enabled, the Ethernet speed is negotiated. When hard set, 10 and 100 speeds are half duplex.*

Default: auto
set EthernetSpeed [dp1 | all] [10 | 100 | 1000 | auto]
get EthernetSpeed [dp1 | all]

Exit
Terminates the current CLI session over Telnet. This command has no effect if used during a serial CLI session.

Exit

FirmwareRestart
*Resets and reinitializes the iPBridge firmware. Use the **forced** option to override any CLI reservations held by other sessions.*

FirmwareRestart <forced>

Help
Issued with no parameters displays a list of available CLI commands. When a CLI command name is specified, a command usage string and command description are displayed.

Help <Command>

IdentifyBridge
*Causes both the **Activity** and **SCSI** LEDs on the iPBridge to blink so that you can identify the iPBridge hardware. Disabling this option cancels the blinking.*

Default: disabled
set IdentifyBridge [enabled | disabled]
get IdentifyBridge

Info
Displays version numbers and other product information for key components within the iPBridge.

Info

IPAddress
Controls the current IP address of the Ethernet port on the iPBridge. If IPDHCP is enabled, the get command reports the current IP address assigned by the network DHCP server, followed by the (DHCP) identifier.

Default: 10.0.0.0 if IPDHCP is disabled
set IPAddress [dp1] [xxx.xxx.xxx.xxx]
SaveConfiguration Restart command required
get IPAddress [dp1 | all]

IPDHCP
Regulates how the iPBridge acquires its IP address. When disabled, the iPBridge uses the IP address specified by the IPAddress CLI command.; when enabled, the iPBridge gets its IP address from a DHCP server.

Default: enabled
set IPDHCP [dp1 | all] [enabled | disabled]
SaveConfiguration Restart command required
get IPDHCP [dp1 | all]

IPGateway

*Controls the current default gateways used by any Ethernet port on the iPBridge. If IPDHCP is enabled, the **get** command reports the current IP gateway assigned by the network DHCP server.*

Default: 0.0.0.0
set IPGateway [dp1 | all] [xxx.xxx.xxx.xxx]
SaveConfiguration Restart command required
get IPGateway [dp1 | all]

IPSubnetMask

Controls the current subnet masks used by any Ethernet port on the iPBridge. If IPDHCP is enabled, the get command reports the current IP subnet mask assigned by the network DHCP server.

Default: 255.255.0.0
set IPSubnetMask [dp1 | all] [xxx.xxx.xxx.xxx]
SaveConfiguration Restart command required
get IPSubnetMask [dp1 | all]

iSCSIAlias

Assigns a human-readable name to the iPBridge. Aliases may be 1 to 64 characters in length and may contain spaces if enclosed in quotes.

Default: " "
set iSCSIAlias [Alias]
get iSCSIAlias

iSCSIChap

*Regulates whether CHAP (Challenge-Handshake Authentication Protocol) is to be used for the iSCSI protocol. If CHAP is enabled, the target requires the initiator to negotiate CHAP authentication using the CHAP secrets. An initiator may reject this negotiation. If **discovery** is specified, the setting applies to CHAP during discovery sessions.*

Default: disabled
set iSCSICHAP [default | Target Name | discovery]
[enabled | disabled]
get iSCSICHAP [default | Target Name | discovery]

iSCSIChapSecret

*Specifies the incoming and outgoing passwords for iSCSI CHAP sessions. Secrets are case sensitive, 12 to 32 characters, and cannot contain spaces. **In** and **out** secrets must be different for each name. If **discovery** is specified, the setting applies to CHAP during discovery sessions. An **in** secret authenticates the server to the iPBridge. The iPBridge can store up to 32 **in** secrets, each with a unique Account Name and secret pair. An **out** secret authenticates the iPBridge to the server. There is only one **out** secret per target which cannot be deleted. The **account name** for the out secret is **root** by default.*

set iSCSICHAPSecret [default | target name | discovery]
[in [Account Name | all] | out [root] | delete [Account Name | all]] <Secret>
get iSCSICHAPSecret [default | target name | discovery]
[in [Account Name | all] | out [root]]

iSCSIInitiators

Displays a list of previous and current successfully logged-in iSCSI initiators, including successful initiators recorded in the event log and any initiators manually added since the last reboot. This list is cleared if the event log is cleared.

iSCSIInitiators

iSCSIPortNumber

Specifies the port number which listens for iSCSI connections. Port number must be between 1024 and 65535 with the exception of port 860.

Default: 3260
set iSCSIPortNumber [dp1 | all] [portnumber]
get iSCSIPortNumber [dp1 | all]

iSCSITarget

Creates/deletes an iSCSI target. The target name acts as a suffix to the standard iPBridge iSCSI-qualified name. The target name may not exceed 24 characters. A newly-created target has one LUN, the iPBridge LUN, at LUN 0. AccessControl is enabled by default, unless iSNSLoginControlis already enabled. If the target name already exists, this command does nothing. The default target cannot be deleted.

iSCSITarget [Target Name] <delete>

iSCSITargetNameDisplay

Displays iSCSI target names.

iSCSITargetNameDisplay

iSCSIWANIPAddress

*Sets or displays the IP address reported to an iSCSI initiator located outside the iPBridge LAN. If this iPBridge is behind a NAT router, the address must be set to the external IP address of the router. Setting the address to **0.0.0.0** causes the iPBridge to be inaccessible from outside the LAN.*

Default: 0.0.0.0
set iSCSIWANIPAddress [dp1] | all] [xxx.xxx.xxx.xxx]
get iSCSIWANIPAddress [dp1] | all]

iSNSLoginControl

Specifies whether the iPBridge delegates its access control/authorization policy to an iSNS server.

Note

iSNSLoginControl cannot be used with AccessControl.

Default: disabled
set iSNSLoginControl [enabled | disabled]
get iSNSLoginControl

iSNSServer

*Specifies the IP address of a valid iSNS server from which the iPBridge tries iSCSI initiator discovery. Set to **0.0.0.0** to disable iSNS server lookup.If VLAN is enabled, a VLAN ID must be specified for each data port. All iSNS connections have the same VLAN tag.*

Default: 0.0.0.0
set iSNSServer [xxx.xxx.xxx.xxx] <dp1] [VLAN ID]>
get iSNSServer

IsReserved

Displays the reservation status of the current iPBridge.

IsReserved

Password

Specifies the password used for all sessions: NDMP, Telnet, FTP and ExpressNAV. Password is case sensitive, 0 to 32 characters, and cannot contain spaces. An empty password can be configured by pressing the enter key when prompted for the new password and new password confirmation.

Default: Password
set Password

Ping

Sends an ICMP echo request to the specified host.If VLAN is enabled, the VLAN ID must be provided.

ping [dp1] [xxx.xxx.xxx.xxx] <count <size>>

ReadOnlyPassword

Specifies a password which allows only read and no writes. It is case sensitive, 0 to 32 characters, and cannot contain spaces. An empty password can be configured by not specifying one.

Default: Password
set ReadOnlyPassword

ReadOnlyUsername

Specifies the user name which allows only read and no writes. It is case insensitive, 1 to 32 characters, and cannot contain spaces.

Default: user
set ReadOnlyUsername [username]
get ReadOnlyUsername

Reserve

Reports the state of CLI reservation for the current CLI session. If the command reports that Reservations are enabled, then another CLI session has control of parameter modification on the unit.

Reserve

RestoreConfiguration

*Issued with the **default** option, forces the iPBridge NVRAM settings to their original defaults. The **saved** option undoes any changes made to this session since the last save.*

RestoreConfiguration [Default | Saved]

RMON

Displays Ethernet data and allows data collection at specified intervals. Get displays hex.

Valid range for bucketsRequest= 1-180
Valid range for ethernetStat index = 1-3
Valid range for historyControl = 1-6
Valid range for ethernetHistory index = 1-6
Valid range for sampleIdx = 1-2147483647
Valid range for interval = 1-3600

Default: See Exhibit A-3 on page xiii of the Appendix
set rmon [idx] [bucketsRequest] [interval] [valid | invalid]
get rmon [ethernetStat | historyControl] <idx>
get rmon [ethernetHistory] <idx sampleIdx>

Route

*Assigns an iSCSI protocol address to a target destination device. If you try to map a new SCSI BTL to the same iSCSI LUN, the new BTL overwrites the previous map. Using the **Delete** identifier instead of **SCSI** removes the map from its map table. In verbose mode, overwriting a map requires secondary confirmation.*

Route [iSCSI] [default | Target Name] [lun] [SCSI <sb st sl> | Bridge | Delete]

RouteDisplay

Displays s a combined list of iSCSI to SCSI bus, target, LUN mappings. The optional target name limits the list to maps which have that target name. The optional LUN parameter limits the list further to the map which satisfies a search for the given LUN.

RouteDisplay iSCSI <default <lun> | Target Name <lun>>

SaveConfiguration

*Issued with the **restart** option, cycles iPBridge power after saving configuration changes. The **norestart** option saves changes without restarting.*

Note

Certain modifications require a system restart.

SaveConfiguration <Restart | NoRestart>

SCSIDomainValidation

Runs Domain Validation tests on the SCSI system which may detect problems with SCSI cables, termination or damaged transceivers. Tape drives attached to the iPBridge should be loaded with media. The media is not overwritten. Disable VirtualDriveResponse before running this test and reboot the iPBridge after running the test.

SCSIDomainValidation

SCSIInitID

Specifies the persistent SCSI initiator ID used by the iPBridge on this SCSI bus. All maps coinciding with the user-specified ID are destroyed after this command is issued.

Default: 0x07
set SCSIInitID [sb] [0-15]
get SCSIInitID [sb]

SCSIPortBusSpeed

Controls the transfer rate at which the iPBridge attempts to negotiate with its SCSI devices

Default: ultra320
set SCSIPortBusSpeed [sb] [fast | ultra | ultra2 | ultra160 | ultra320]
get SCSIPortBusSpeed [sb]

SCSIPortList

Lists the status of the SCSI port.

SCSIPortList

SCSIPortReset

Resets the SCSI bus.

SCSIPortReset [sb]

SCSIPortResetOnStartup

Controls whether the SCSI bus is reset each time the iPBridge is powered up.

Default: enabled
set SCSIPortResetOnStartup [sb] [enabled | disabled]
get SCSIPortResetOnStartup [sb]

SCSIPortSyncTransfer

Controls the iPBridge attempts to negotiate synchronous SCSI transfers with devices on the specified bus.

Default: enabled
set SCSIPortSyncTransfer [sb] [enabled | disabled]
get SCSIPortSyncTransfer [sb]

SCSIPortTermination

Configures the SCSI internal termination of the specified SCSI port. Enabling termination allows the iPBridge to act as a terminator at the end of a SCSI chain.

Default: enabled
set SCSIPortTermination [sb] [enabled | disabled]
get SCSIPortTermination [sb]

SCSIPortWideTransfer

Controls the iPBridge attempts to negotiate wide SCSI transfers with devices on the specified bus.

Default: enabled
set SCSIPortWideTransfer [sb] [enabled | disabled]
get SCSIPortWideTransfer [sb]

SCSITargetLUNs

Controls the maximum number of SCSI LUNs per target the iPBridge queries during a SCSI bus scan.

Default: 8
set SCSITargetLUNs [sb] [8 | 64]
get SCSITargetLUNs [sb]

SCSITargets

Lists the physical devices that are connected and running on the specified SCSI port.

SCSITargets [sb]

SerialNumber

Displays the serial number of the iPBridge. The serial number is a 13 character field. The first seven alphanumeric characters are an abbreviation representing the product name. The remaining six digits are the individual iPBridge number.

get SerialNumber

SerialPortBaudRate

Configures the baud rate for the iPBridge RS-232 serial port. The number of data bits per character is fixed at 8 with no parity.

Default: 115200
set SerialPortBaudRate [2400 | 9600 | 19200 | 38400 | 57600 | 115200]
SaveConfiguration Restart command required
get SerialPortBaudRate

SerialPortEcho

Controls if the iPBridge echoes characters on its RS-232 port. When enabled, all non-control character keyboard input is output to the display.

Default: enabled
set SerialPortEcho [enabled | disabled]
get SerialPortEcho

SNMP

Controls whether or not SNMP functions on the iPBridge.

Default: enabled
set SNMP [enabled | disabled]
get SNMP

SNMPDumpMIB

Displays the contents of the ATTO iPBridge private SNMP MIB to the current CLI session. For further assistance with SNMP, consult your network administrator.

SNMPDumpMIB

SNMPExtendedTraps

Regulates Extended (i.e., Device Transition and Device Error) SNMP trap functionality.

Default: disabled
set SNMPExtendedTraps [enabled | disabled]
get SNMPExtendedTraps

SNMPTrapAddress

Regulates or displays IP Trap Addresses and Trap Levels. ***Index*** *is a value from 1 to 6. The IP address must be in the same subnet as the iPBridge, and is the host that wishes to receive traps. The supported severity levels required to trigger a trap are:* ***None, All, Warning, Critical***

Default IP address: 0.0.0.0
Default level: none
set SNMPTrapAddress [index] [xxx.xxx.xxx.xxx] [None | All | Warning |Critical]
get SNMPTrapAddress [index]

SNMPTraps

Regulates SNMP traps.If VLAN is enabled on a data port, a VLAN ID for that port must be specified. All SNMP traps are sent with the same VLAN tag.

Default: disabled
set SNMPTraps [enabled |disabled] <[dp1] [VLAN ID]>
get SNMPTraps <[dp1] [VLAN ID]>

SNTP

Controls whether SNTP time server is used.If VLAN is enabled on a data port, a VLAN ID for that port must be specified.

Default: enabled
set SNTP [enabled | disabled] <[dp1] [VLAN ID]>
SaveConfiguration Restart command required
get SNTP <[dp1] [VLAN ID]>

SNTPServer

Controls or displays the main IP address the client uses to retrieve the SNTP time.

Default: 192.43.244.18
set SNTPServer [xxx.xxx.xxx.xxx]
SaveConfiguration Restart command required
get SNTPServer

SpeedWrite

*Improves the performance of SCSI WRITE commands to target devices attached to the iPBridge. Specify **all** to set the Speed Write state for each currently mapped device on the iPBridge, or to get a list of the Speed Write states of all currently mapped devices on the iPBridge.*

Default: disabled
set SpeedWrite SCSI [sb st sl | all] [enabled | disabled]
get SpeedWrite SCSI [sb st sl | all]

SpeedWriteDefault

Specifies the default SpeedWrite state applied to new device mappings created manually or using an AutoMap operation.

Default: disabled
set SpeedWriteDefault [enabled | disabled]
get SpeedWriteDefault

TailEventLog

*Displays new events to the terminal. Type **quit** then press **ENTER** to exit tail mode.*

TailEventLog

Time

Controls or displays the current time as clocked by the iPBridge in 24 hour format.

set Time [HH: MM: SS]
get Time

TimeZone

Controls or displays the time zone or an offset from GMT.

Default: EST
set TimeZone [[EST | CST | MST | PST] | [[+| -]
[HH]:[MM]]]
SaveConfiguration command required
get TimeZone

Username

Specifies the user name for all sessions. It is case insensitive, 1 to 32 characters, and cannot contain spaces.

Default: root
set Username [username]
SaveConfiguration command required
get Username

VerboseMode

Controls the level of detail in CLI Help output and command response output for the current CLI session.

Default: enabled
set VerboseMode [enabled | disabled]
get VerboseMode

VirtualDriveResponse

Provides proxy responses to SCSI INQUIRY and TEST UNIT READY commands if a SCSI device selection times out or has a busy event. Host systems can assign devices consistently regardless of the device's state during the execution of the commands.

Default: disabled
set VirtualDriveResponse [enabled | disabled]
get VirtualDriveResponse

VLAN

Sets Virtual LAN ID values for each Ethernet data port. Up to 8 IDs can be stored per port. Incoming packets are filtered if their tags are not on the list of VLAN IDs for that data port. Outgoing packets are tagged to match their connection. Each VLAN ID is assigned a VLAN name of up to 64 characters. If no VLAN IDs exist for a data port, VLAN is disabled for that data port.

set VLAN [dp1] [[VLAN ID] [VLAN Name] <delete> | [all]
[delete]]
get VLAN [dp1]

Exhibit A-3 Default history Control table (buckets and interval in hexadecimal) for the RMON CLI command.

```
Idx DataSrc              BktReq   BktGrant Interval Owner   Status
================================================================
001 43.6.1.2.1.2.2.1.1.1 00000032 00000032 0000001e monitor 00000004
002 43.6.1.2.1.2.2.1.1.1 00000032 00000032 00000708 monitor 00000004
003 43.6.1.2.1.2.2.1.1.2 00000032 00000032 0000001e monitor 00000004
004 43.6.1.2.1.2.2.1.1.2 00000032 00000032 00000708 monitor 00000004
005 43.6.1.2.1.2.2.1.1.3 00000032 00000032 0000001e monitor 00000004
006 43.6.1.2.1.2.2.1.1.3 00000032 00000032 00000708 monitor 00000004
```

Appendix C Safety standards and compliances

The equipment described in this manual generates and uses radio frequency energy. If this equipment is not used in strict accordance with the manufacturer's instruction, it can and may cause interference with radio and television reception. See the Technical Specification sheet for a full list of certifications.

WARNING

Risk of explosion if battery is removed and/or replaced by an incorrect type. Dispose of used batteries in accordance with your local environmental regulations.

No operator serviceable components inside the iPBridge 1550D.

Do not remove cover of the iPBridge 1550D. Refer servicing to qualified personnel.

FCC Standards: Radio and Television Interference

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide a reasonable protection against such interference when operating in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures

- Move the receiving antenna.
- Relocate the bridge with respect to the receiver, or move the bridge away from the receiver.
- Plug the computer into a different outlet so the computer and receiver are on different branch circuits.
- If necessary, consult an ATTO authorized dealer, ATTO Technical Support Staff, or an experienced radio/television technician for additional suggestions.

The booklet *How to Identify and Resolve Radio/TV Interference Problems* prepared by the Federal Communications Commission is a helpful guide. It is available from the US Government printing office, Washington, DC 20402, Stock No. 004-000-00345-4.

Canadian Standards

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

European Standards: Declaration of Conformity

This following statement applies to the ATTO iPBridge.

This device has been tested in the basic operating configuration and found to be compliant with the following European Union standards

Application of Council Directive: 89/336/EEC

Standard(s) to which conformity is declared: EN55022, EN50082-1

This Declaration will only be valid when this product is used in conjunction with other CE approved devices and when the entire system is tested to the applicable CE standards and found to be compliant.

The ATTO iPBridge 1550 complies with Directive 2002/95/EC on the Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS).